Sharp Bounds for the Elliptic Sombor Index of Four New Graph Operations

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Abstract

For a graph G, the *elliptic Sombor index*, denoted by $ESO(G)$, is defined as $ESO(G) = \sum_{uv \in E(G)} (d(u) + d(v))\sqrt{d(u)^2 + d(v)^2}$. In this paper, we establish sharp upper and lower bounds for $ESO(G)$ of four new graph operations in terms of the maximum degree, minimum degree, order, and size of the original graphs.

Keywords: Elliptic Sombor index, Graphs operations, Graph Products.

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